

CLAIMS

1. A steerable nozzle for a rocket engine comprising: a casing (10) surrounding a combustion chamber (12) and having a rear end wall (14); a nozzle comprising a moving diverging portion (20) and a static portion (16) secured to the rear end wall; a jointed link device connecting the moving diverging portion of the nozzle to the static portion, the moving diverging portion and the static portion being in mutual contact via respective spherical surfaces (24a, 16a); and an actuator device (50a, 50b) acting on the moving diverging portion of the nozzle to enable the direction of the thrust vector of the engine to be varied by modifying the orientation of the nozzle with the spherical surfaces sliding one on the other,

the nozzle being characterized in that resilient return means (62, 64) are interposed between the moving diverging portion (20) of the nozzle and the static portion (16), said means acting on the moving diverging portion to urge it towards the static portion so as to keep the spherical surfaces (24a, 16a) in mutual contact for any desired orientation of the nozzle.

2. A nozzle according to claim 1, in which the link device is a cardan mount comprising a ring (30), two first link arms (32, 34) connecting the moving diverging portion (20) of the nozzle to the ring via two first hinges (36, 38), and two second link arms (42, 44) connecting the ring (30) to the rear end wall (14) of the casing via two second hinges (46, 48), the nozzle being characterized in that the resilient return means (62, 64) are integrated in link arms.

3. A nozzle according to claim 2, characterized in that the resilient return means (62, 64) are integrated in the first link arms (32, 34).

4. A nozzle according to any one of claims 1 to 3, characterized in that the resilient return means are constituted by prestressed springs (62, 64).
- 5 5. A nozzle according to claim 1 or claim 2, characterized in that the resilient return means are constituted at least in part by an elastically deformable part of the link device which is elastically deformed on assembly.
- 10 6. A nozzle according to claims 2 and 5, characterized in that the elastically deformable part is the ring of the cardan mount.
- 15 7. A nozzle according to any one of claims 1 to 6, characterized in that anti-friction means are present between the spherical surfaces in mutual contact.
- 20 8. A nozzle according to claim 7, characterized in that the anti-friction means are constituted by a lubricant.
9. A nozzle according to claim 8, characterized in that the lubricant is a graphite grease.
- 25 10. A nozzle according to claim 7, characterized in that the anti-friction means are constituted by a coating or by an interface part in the zone of contact between the spherical surfaces.
- 30 11. A nozzle according to any one of claims 1 to 10, in which the link device is a cardan mount having two pivot axes, the nozzle being characterized in that the actuator device comprises rotary actuators positioned on the cardan axes in order to steer said axes directly.